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LETTER OF AGREEMENT
AMONG
US COAST GUARD (USCG),
US ENVIRONMENTAL PROTECTION AGENCY (USEPA),
US DEPARTMENT OF COMMERCE,
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA),
AND
US DEPARTMENT OF THE INTERIOR
CONCERNING THE USE *IN-SITU* BURNING AS A
RESPONSE METHOD TO OIL POLLUTION
FOR THE AREA 35-200 NAUTICAL MILES OFF THE CALIFORNIA COAST
PURPOSE

The Region IX Mainland Regional Response Team (RRT-IX Mainland) recognizes that mechanical recovery, *in-situ* burning and chemical dispersants are the three primary means of dealing with oil discharges into the waters of the United States. While mechanical removal is the preferred method, the RRT-IX Mainland recognizes that *in-situ* burning is a viable option in conjunction with, or in lieu of mechanical or other types of recovery. The purpose of this Letter of Agreement is to provide concurrence of the US Environmental Protection Agency (USEPA) representative, the US Department of the Interior (DOI) representative, and the US Department of Commerce (DOC)-National Oceanic and Atmospheric Administration (NOAA) representative for the use of *in-situ* burning for oil discharges on the waters within the jurisdiction of the RRT-IX Mainland 35-200 nautical miles off the Coast of California within the geographical boundaries described in Geographical Boundaries, Page two. This concurrence is given to the federally pre-designated US Coast Guard Federal On-Scene Coordinators (FOSC). This agreement gives guidelines to allow the FOSC to use *in-situ* burning in a timely manner to: (1) prevent or substantially reduce a hazard to human life; (2) minimize the adverse environmental impact of the spilled oil, and (3) reduce or eliminate, the economic or aesthetic losses of recreational areas.

This agreement for pre-approval is necessary, due to the time constraints under which burning is a viable option. In developing this pre-approval agreement, the environmental impacts associated with an on-water oil burn have been evaluated in relationship to other mechanical and chemical alternatives. It is the view of the signatories that the overall environmental benefits of *in-situ* burning outweigh the relative environmental costs, except in those circumstances noted in this agreement.

If the conditions for pre-approval are not met, selected representatives in the RRT-IX Mainland must be involved prior to commencing with any *in-situ* burn. In accordance with the provisions of the National Contingency Plan, this means that the concurrence of the US EPA representative to the RRT, in consultation with the natural resource trustee Federal agencies, is required. If the burn is being considered within the area 0-35 nautical miles off the California Coast, consultation with the State of California representative to the RRT-IX Mainland is also required. If the burn is being considered within State waters, the concurrence of the State of California representative is required.

AUTHORITY

Subpart J of the National Oil and Hazardous Substances Pollution Contingency Plan (the National Contingency Plan or NCP) provides that the Federal On-Scene Coordinator (FOSC) with the concurrence of the US Environmental Protection Agency (USEPA) representative to the Regional Response Team (RRT) and the concurrence of the State with jurisdiction over the navigable waters polluted by the oil discharge, may authorize the use of *in-situ* burning of oil spills. The Commandant of the US Coast Guard has pre-designated the USCG Captains of the Port under his jurisdiction as On-Scene Coordinators for oil spills, and has delegated authority and responsibility for compliance with Section 311 of the Federal Water Pollution Control Act (FWPCA), as amended, to them. The Governor of the State of California has delegated responsibility to coordinate State approval for proper usage of *in-situ* burning for control of oil spills within State waters to the State of California Office of Oil Spill Prevention and Response (OSPR), within the Department of Fish and Game (DFG). The USEPA has been delegated authority under Subpart J of the NCP to authorize use of *in-situ* burning for control of oil spills.

SCOPE

The USCG, USEPA, NOAA, and DOI agree that the physical removal of discharged or spilled oil from the water surface is the primary method of control. Furthermore, it is recognized that the most effective response to an oil spill may include a combination of mechanical recovery, *in-situ* burning and dispersant or other chemical use. As such, this Letter of Agreement sets guidelines under which *in-situ* burning may be used by the USCG Federal On-Scene Coordinator on or in Federal waters 35-200 nautical miles off the Coast of California - waters which are also within the boundaries of the Eleventh Coast Guard District.

GEOGRAPHICAL BOUNDARIES

The geographical area covered by this Agreement is the Pacific Ocean at a distance 35-200 nautical miles from the Mainland California Coast.

PROTOCOLS

As attested to by the signatures set forth below, the USEPA, the USDOC-NOAA, and the USDOl agree with the USCG that the pre-designated USCG FOSC may consider the use of *in-situ* burning of oil discharges, as defined in the NCP, in accordance with the following guidelines.

GUIDELINES

1. As per the NCP, 40 CFR Part 300.120, the authority to use *in-situ* burning of oil discharges in accordance with this Agreement is vested in the pre-designated USCG FOSC. The pre-designated USCG FOSCs along the California Coast are the Captain of the Port of San Francisco, the Captain of the Port of Los Angeles-Long Beach, and the Captain of the Port San Diego. This authority may not be delegated.
2. The USCG FOSC may authorize the use of *in-situ* burning without obtaining the concurrence of the USEPA representative or the Federal natural resource trustee representatives to the RRT-IX Mainland, when, in the FOSC's judgment, human life is threatened or when all of the following three conditions are met:
 - A. *In-situ* burning is a viable option for oil removal; and
 - B. The potential plume caused by the burn will not expose unprotected human populations to more than 150 ug/m³ of particulates less than 10 microns in diameter averaged over a one-hour period as determined by the FOSC (on-scene worker safety shall be addressed by the Site Safety Plan, meeting OSHA requirements); and
 - C. The plume or heat from the burn will not result in greater impact to sensitive wildlife resources than would the spilled oil (in situ Burning Checklist information shall be compiled by the FOSC in advance of the burn).

3. Mechanical recovery equipment shall be mobilized on scene, when feasible, as a backup capability should *in-situ* burning prove ineffective
4. Wind patterns will be predicted by the NOAA SSC, and will be monitored in real time prior to and during the burn by the FOSC. If the prevailing wind direction is either parallel to the shore or away from the shore, it will be assumed that there is no unprotected human exposure above 150 Ug/M3 of particulates less than 10 microns in diameter averaged over a one-hour period as determined by the FOSC.
5. A designated Federal agency representative will be on scene to observe the burn and the prevailing wind direction. If practical, so as not to create an unnecessary delay, monitors from the DOI and DOC-NOAA will be provided they try to observe the burn and record results. Any of these observers/monitors has the authority to halt any burn if he observes that the conditions in Paragraph 2 are no longer true. The protocol for observing and halting a burn is described in the *In-situ* Burning Monitoring Plan (Appendix III).
6. In any case where the circumstances do not meet the criteria set forth in Paragraph 2, the pre-authorized use of *in-situ* burning is not authorized.
7. If the FOSC feels *in-situ* burning should be used in areas not met by Paragraphs 2.A., 2.B., 2.C., or in areas not part of the pre-authorized geographical boundaries, the FOSC must request approval from the pertinent RRT-IX Mainland member agencies, in accordance with the NCP requirements. The FOSC shall submit the request along with the required information listed in the provided *in-situ* Burning Checklist.
8. Burning will be conducted by trained professionals using recognized techniques and technology.
9. Burning will be conducted in a way that allows for rapid controlling and stopping of the burn to account for wind shifts. When a decision is made to conduct a burn operation, the FOSC shall notify the USCG Co-Chair for the RRT-IX Mainland. The Co-chair shall notify the signatories of this agreement immediately.
10. Contained burning is recognized as the preferred method of burning, using burn resistant boom or similar technology. The ignition of slicks is not permitted if there is a significant chance of igniting the source or if there is a significant hazard to adjacent structures or vessels.

DOCUMENTATION, MONITORING AND EVALUATION

1. NOTIFICATION AND REPORTING TO THE RRT. If the FOSC decides to conduct an *in-situ* burn, a description of the operation shall be documented and submitted to the RRT-IX Mainland as soon as possible following the burn. Typical information to be included is listed in Appendix B (an example of the *in-situ* Burning Plan from the Oceania RRT), Appendix C (an example of the *in-situ* Burning Monitoring Plan from the Oceania RRT), and Appendix D (an example of the *in-situ* Burn Site Safety and Health Plan from the Oceania RRT). These appendices must be modified as appropriate so that information provided is geographically pertinent to the given *in-situ* burn conditions. The evaluation noted in Paragraph 3 of this section will be completed as part of the FOSC Report. An FOSC Report shall be required whenever an *in-situ* burn is conducted.
2. DOCUMENTATION. The FOSC will ensure that all information described in the previous Paragraph 1 is documented.
3. MONITORING. The Federal natural resource agencies and the USCG will conduct monitoring of the *in-situ* burn in general accordance with the example *In-situ* Burning Monitoring Plan, attached as Appendix III. As part of the Monitoring Plan, oil samples shall be taken prior to the burn and samples of any floating residue shall be taken following the burn.

4. EVALUATION. The FOSC shall include a full evaluation of all *in-situ* burning applications in any FOSC report following an incident. The report should comment on burn (s), supported by visual record (video, photos) and parties. Data should include estimates of product and analysis of oil residue.

Federal resource agencies shall evaluate the *in-situ* burning to assess environmental and endangered species impacts after ignition.

5. NOTIFICATION OF STATE AGENCIES. The State of California representative to the RRT-IX Mainland (representative from OSPR, DFG) will be notified, along with the other RRT representatives in accordance with Paragraph 1. of this Section. The State representative will be responsible for notifying other appropriate State and, local agencies.

OTHER NOTIFICATIONS. The USCG is responsible for notification of neighboring regions (RRT-Region X) and Mexico - depending upon the location of the *in-situ* burn site.

AMENDMENTS

This Letter of Agreement will be reviewed annually and amended as appropriate.

This Letter of Agreement may be amended in writing in whole or in part as is mutually agreeable to all parties thereto.

This Letter of Agreement may be canceled by any party hereto upon thirty (30) days written notice to the other parties.

DATE

//s//

KATHLEEN G. SHIMMIN
USEPA REGION IX
CO-CHAIR, RRT-IX MAINLAND

4/10/97

//s//

WILLIAM H. BOLAND
CAPTAIN, U. S. COAST GUARD
CO-CHAIR, RRT-IX MAINLAND

4/10/97

//s//

DAVID M. KENNEDY
US DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
REPRESENTATIVE TO THE RRT-IX MAINLAND

4/10/97

//s//

PATRICIA SANDERSON PORT
US DEPARTMENT OF THE INTERIOR
REPRESENTATIVE TO THE RRT-IX MAINLAND

4/10/97

- Appendix A Overview of *In-situ* Burning as an Oil Spill Response Tool
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- Appendix F Resolution of Questions Re LOA

APPENDIX A OF ISB LOA

OVERVIEW OF INSITU BURNING AS AN OIL SPILL RESPONSE TOOL

Burning has distinct advantages over other spill response tools. First, it offers the potential to remove large quantities of oil rapidly from the environment. *In-situ* burning could potentially remove as much oil in one day as mechanical methods could in one month. In addition, *in-situ* burning could prevent a large amount of shoreline contamination and injury to biota by removing oil before it spreads and moves to other areas. Second, *in-situ* burning requires less equipment and personnel than do other response tools. It can be used in areas where other methods cannot because of distances and lack of infrastructure. Third, burning significantly reduces the volume of material requiring disposal - compared to mechanical recovery. Mechanically -recovered oil must still be transported, stored, and properly disposed. This involves equipment, personnel, time, money, and an approved Resource Conservation and Recovery Act (RCRA) disposal site. Often, these resources are not available in sufficient quantities when large spills occur.

Burning also has disadvantages. The most obvious are the large black smoke plume that is produced by burning oil and concerns about potential associated health effects.

Additionally, oil must be a minimum thickness of 2 to 3 millimeters (mm) to burn efficiently; thin slicks will not burn. This can be partially countered with the use of fire booms to concentrate oils into thicker slicks before burning. However, as oil spreading and dispersion take place over time, the ability to achieve this minimum thickness becomes increasingly difficult.

In-situ burning is considered a trade-off between the ability to remove large amounts of spilled oil from the water surface in a short period of time and the human health effects and ecological impacts of burn by-products. Preliminary data from recent test burns indicate that airborne emissions are not a serious concern at distances greater than a few miles, given the proper atmospheric conditions.

OPERATIONAL LIMITATIONS

- 1 . FIRE BOOM. The application of *in-situ* burning requires the physical collection and containment of oil to maximize the efficiency of the burning process and to provide a means to control the burn. Generally, this is accomplished by the use of a fire boom or some other type of boom.
2. IGNITION. Heavy oils require longer heating times and a hotter flame to ignite compared to lighter oils. Many ignition sources can supply sufficient heat. These include pyrotechnic igniters, laser ignition systems, and aerial ignition systems. Each has pros and cons to their use. Whichever method is used, considerations of safety and efficiency must enter into the decision process.
- 3 . OIL THICKNESS. The rule of thumb of *in-situ* burning is that oils can be effectively burned if they are consistently 2 to 3 mm thick.
4. GATHERING. Igniting weathered oil is generally not a problem with most ignition sources because they have sufficient temperature and burn time to ignite most oils. Weathered oil requires a longer ignition time and higher ignition temperatures.
5. EMULSIFICATION. The effect of water content on oil ignition is thought to be similar to that of weathering. It is certain that oil containing some water can be ignited and burned. It is suspected that burning may break down the water-in-oil emulsion. If a burn can be started, then water content is likely not a problem.

SAFETY CONCERNS

1. FIRE HAZARD. Care must be taken that the burn be controlled at all times to ensure the safety of personnel and property. This precludes burning at sources such as tankers, ships, or tank farms unless means are taken to ensure that the flame cannot propagate from the burn location to the source.
2. IGNITION HAZARD. Personnel and equipment involved in ignition of the oil slick must be well coordinated. Weather and sea conditions need to be kept in mind and adequate safety distances be kept at all times. Specialized ignition equipment, unknown fire behavior and uncertain flash-points introduce safety risks.
3. VESSEL SAFETY. Burning at sea may involve the use of several vessels operating in close proximity, perhaps at night or in conditions of poor visibility. These conditions are hazardous by nature and generally require training and close coordination. Maneuverability while towing boom or positioning other containment equipment will require skilled personnel.
4. TRAINING. Training of personnel to operate equipment for *in-situ* burning should be developed to minimize the risk of injury and accident. Training should meet all applicable OSHA regulations and guidelines. Workers may require respiratory protection and protective clothing, based on risk evaluations by trained site safety or industrial hygiene personnel.

Other hazards can include the exposure of personnel to extreme heat conditions, smoke and fumes; working under time constraints or extended periods of time. Personnel involved with burning operations must be well briefed on the plan of operations, with site safety stressed, and must be notified of all changes from the approved burn plan. The need for burning could be questioned and should be reconsidered if conditions (e.g., weather, operations, equipment) pose a threat or danger to human health and safety, or facilities. This section is not inclusive of all safety concerns. As more knowledge is gained from burning, it is most likely that additional safety concerns will be identified. The site safety plan shall specify worker safety practices and equipment requirements.

HUMAN HEALTH/TOXICITY CONCERNS

Many experts believe that the human health risk from oil fire smoke is relatively small, particularly when compared to health and safety risks associated with mechanical remediation. This assessment, coupled with the likelihood that the lighter fraction of a spill will evaporate unless burned (thereby imposing its own set of health concerns) suggests that the risk is worth considering.

Burning oil produces a visible smoke plume containing smoke particulates, combustion gases, unburned hydrocarbons, residue left at the burn site and other products of combustion. It also results in the evaporation and release of volatile compounds from the oil. Public health concerns relate to the chemical content of the smoke plume and the downwind deposition of particulates. It should be noted that not burning an oil spill also introduces its own air quality concerns. Analysis of the physical behavior of spilled oil has shown that 50 percent of a light crude oil spill can evaporate fairly readily, and it is the acutely-toxic lighter fractions of a crude oil mix that quickly move into the atmosphere.

Results of recent burn tests indicate that burning *in situ* does not yield significant emissions above that expected for similar types of combustion, such as forest fires. Many human health experts feel that the most significant human health risk resulting from *in-situ* burning is inhalation of the fine particulate material that is a major constituent of the smoke produced. An early assessment of health concerns attributable to the Kuwaiti oil fires identified the less than 10-micron particulate matter as representing the greatest health hazard in that situation. The extent to which these particles present a health risk during an *in-situ* burn depends on the concentration and duration of exposure. It is important to remember that particulates in these concentrations are so small that they do not settle readily. They will be carried by the prevailing wind over large distances, over which their concentrations will rapidly decline.

Polynuclear aromatic hydrocarbons (PAHS) are a group of hydrocarbons produced during *in-situ* burning. They are found in oil and oil smoke, where their relative concentrations in the latter tend to be higher than in the oil itself. Possible carcinogenicity of some members make this group a serious health concern, although it is generally long-term exposure to the higher molecular-weight PAHs that is the basis for concern. Sulfur dioxide (SO₂) and nitrogen dioxide (NO₂) are eye-and-respiratory-tract irritants that are produced by oil combustion. Concentration of PAHs decline downwind as smoke from the fire is diluted by clean air. The concentrations of other by-products of burning oil (i.e., combustible gases) also decline downwind.

ECOLOGICAL EFFECTS

Potential ecological impacts resulting from the use of *in-situ* burning have not been extensively studied. Whether *in-situ* burning does result in ecological impacts cannot be directly determined based on existing information. Potential biological impacts are the subject of planned field and laboratory tests.

The surface area affected by burning oil is usually small relative to the total surface area of a given body of water, relative to the total depth of the water body, and is less than the area impacted by the oil slick. This does not preclude adverse ecological effects. The possibility remains that contamination at the sea surface could affect certain unique populations as well as organisms that use surface layers of the water column at certain times to spawn or feed. However, because the distribution of these populations is patchy, these impacts would most likely be localized. The same populations would also be adversely affected to some degree by an oil slick. The plume or heat from the burn will not result in greater impact to populations.

The residual material of an *in-situ* burn is a hydrocarbon compound with little structural change other than the loss of the more volatile groups. It resembles weathered oil of the same source type.

Burn residues could be ingested by fish, birds, mammals, etc. and could be a source of fouling of wildlife; however, it should be noted that the water surface is already adversely affected by oil, and any additional adverse effects from burning would be comparatively small. The extent of these spatial and temporal effects would be expected to be much less severe than those from a large oil spill contained by traditional mechanical methods. The residual material should be removed as soon as possible, and this could be accomplished using traditional spill containment and cleanup equipment and techniques.

Measurements conducted during test burns show that water temperature is not raised significantly, even in shallow confined test tanks. Thermal transfer to the water is limited by the insulating oil layer and is actually the mechanism by which the combustion of oil slicks is extinguished.

Except where conditions of pre-approval are met, the appropriate State and the Federal trustees (e.g., NOAA, DOI) are to be consulted before using *in-situ* burning on oil spills. They can identify resources of concern in the area that could be potentially adversely affected by burning *in situ*. Interests include but are not limited to:

the proximity of occurrence of the proposed burn in coastal marshes and estuaries and inland marsh/wetland environments;

the occurrence and location of threatened and endangered species in relation to the proposed burn site;

the occurrence and location of sensitive/critical habitat or resources (e.g., land) in relation to the proposed burn site; and

the benefits to sensitive habitats of burning versus the effects resulting from the land fall of oil.

APPENDIX B: IN-SITU BURNING PLAN

THIS CHECKLIST IS PROVIDED AS A SUMMARY OF IMPORTANT INFORMATION TO BE CONSIDERED BY THE UNIFIED COMMAND IN REVIEWING ANY REQUEST TO CONDUCT IN-SITU BURNING IN RESPONSE TO AN OIL SPILL IN THE WATERS OF NORTHERN CALIFORNIA. THIS BURNING PLAN IS DIVIDED INTO SEVERAL SECTIONS OF INFORMATION ABOUT THE SPILL, WEATHER, OIL BEHAVIOR AND PROPOSED BURNING PLAN. IT IS INTENDED THAT THIS BURNING PLAN BE FILLED IN TO HELP THE UNIFIED COMMAND DETERMINE THE FEASIBILITY OF IN-SITU BURNING FOR THE IMMEDIATE SITUATION. THIS BURNING PLAN, IN CONJUNCTION WITH THE MONITORING PLAN, WILL SERVE AS THE POST BURN OPERATIONS REPORT.

SPILL DATA

(RESPONSIBLE PARTY TO COMPLETE AND SUBMIT TO UNIFIED COMMAND)

DATE & TIME OF PLAN

DATE AND TIME OF THE INCIDENT:

LOCATION OF THE INCIDENT:

LATITUDE:

LONGITUDE:

DISTANCE IN MILES AND DIRECTION TO NEAREST LAND:

DISTANCE IN MILES AND DIRECTION TO THE NEAREST POPULATION CENTER(S):

TYPE AND QUANTITY/VOLUME:

RELEASE STATUS:	<input type="checkbox"/> Continuous, at estimated rate of: _____ <input type="checkbox"/> Intermittent, at estimated rate of: _____ <input type="checkbox"/> One time only, flow now stopped.	Estimated quantity - bbls: _____
EMULSIFICATION STATUS:	Is product easily emulsified? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNCERTAIN Is product emulsified upon release? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNCERTAIN IF EMULSIFIED: <input type="checkbox"/> LIGHTLY (0-20%) <input type="checkbox"/> MODERATE (21-50%) <input type="checkbox"/> HEAVILY (>50%) <input type="checkbox"/> UNKNOWN	

SURFACE AREA OF SPILL (SQUARE MILES) - AS OF DATE/TIME:

IS SOURCE BURNING NOW? YES NO

NATURE OF INCIDENT:

Grounding Transfer Operation Collision Pipeline Explosion
 Other: (Describe): _____

VESSEL/FACILITY/PIPELINE INVOLVED:

RESPONSIBLE PARTY:

FEASIBILITY FACTORS:

<input type="checkbox"/> YES	<input type="checkbox"/> NO	Is the oil being considered for In-Situ burning emulsified by less than 60%?
<input type="checkbox"/> YES	<input type="checkbox"/> NO	Is the oil thickness > 1/10 inch?

IN-SITU BURNING PLAN

WEATHER & WATER CONDITIONS

WEATHER: ☐ Sunny ☐ Partly Cloudy ☐ Cloudy ☐ Overcast
☐ Mountain Showers ☐ Offshore Rain Squalls ☐ Heavy Rain

WINDS: Date & Time: _____
 Onshore ☐ Knots: _____ Direction: _____
 Offshore ☐

SEA STATE: ☐ Calm ☐ Choppy ☐ Swell (in feet)
☐ <1 foot ☐ 1-3 foot ☐ >3 foot

TIDES: (FORECAST) Low/High Feet (+/-) Date & Time

SURFACE CURRENTS: Speed / Knots Direction / To

WATER DEPTH: ☐ 10 - 60 feet ☐ 60 - 120 feet ☐ > 120 feet

DAYLIGHT HOURS: Day / Date Sunrise Sunset

WEATHER & WATER 24 HOUR FORECAST

DATE & TIME OF PLAN DEVELOPMENT: _____
 FORECASTED WIND SPEED (knots): _____
 FORECASTED WIND DIRECTION: _____
 FORECASTED SEA STATE: ☐ Calm ☐ Choppy ☐ Swell (in feet)
☐ < 1 foot ☐ 1 - 3 feet ☐ >3 feet

ESTIMATED SMOKE TRAJECTORY

Describe expected smoke plume trajectory:

Is plume expected to impact concentrated human or wildlife populations? ☐ YES ☐ NO

FEASIBILITY FACTORS:

☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO

Is the wind speed < 25 knots?
 Is wave height < 2 - 3 feet?
 Is visibility > 500 feet vertically and ½ mile horizontally?
 Are rain forecasts favorable for ignition?

IN-SITU BURNING PLAN APPX B OF ISB LOA

A. Location of proposed burn relative to the spill source:

B. Location of proposed burn relative to nearest uncontrolled ignitable slick(s):

C. Location of proposed burn relative to nearest sizeable downwind human population:

D. Location of proposed burn relative to nearest downwind concentrated wildlife population:

E Potential for reducing visibility at nearby airport(s) or freeway(s):

F. Will radio notification of human populations be required? ☐ YES ☐ NO

G. Proposed ignition method:

Will burn promoters be used?

☐ YES

☐ NO

Will de-emulsifiers be used?

☐ YES

☐ NO

H. Methods proposed for controlling the burn:

Will fire boom be used?

☐ YES

☐ NO

IN-SITU BURNING PLAN APPX B OF ISB LOA

I. PROPOSED BURNING STRATEGY

- ☐ Controlled burning in fire boom under tow.
- ☐ Controlled burning of static oil contained within fire boom.
- ☐ Complete burning of a derelict or hazardous vessel.
- ☐ Controlled burning of static oil contained in a natural collection site at or near shore.
- ☐ Disposal of oiled debris by controlled burning in remote areas.

OTHER:

J. Estimated amount of oil to be burned:

K. Estimated duration of Burn Operations: (hours)

L. Method of collecting burned residue:

M. Proposed storage and disposal of burned oil residue:

FEASIBILITY FACTORS

- ☐ yes ☐ no Can ignition and a complete burn occur at a safe distance from other response operations and public, recreational and commercial activities?
- ☐ yes ☐ no Is the smoke plume unlikely to impact areas of concentrated human or wildlife populations?
- ☐ yes ☐ no Are adequate fire boom, towboats and igniter resources available?
- ☐ yes ☐ no Are adequate notice to be given to mariners, aircraft pilots and the general public?
- ☐ yes ☐ no Can necessary personnel and equipment be mobilized during the in-situ burning window of opportunity?

IN-SITU BURNING PLAN APPX B OF ISB LOA

PLAN NUMBER:

DATE:

OPERATIONAL PERIOD:

TO:

FEDERAL OSC

☐ **APPROVED**

☐ **NOT APPROVED**

SIGNATURE

Typed Name & Title:

COMMENTS:

IN-SITU BURNING MONITORING PLAN

THE PRIMARY OPERATIONAL PURPOSE IN MONITORING IN-SITU BURNING OF SPILED OIL IS TO DETERMINE IF BURNING REQUIREMENTS AND OBJECTIVES ARE MET. SINCE THE CURRENT BODY OF KNOWLEDGE ABOUT BURNING IS SMALL, EACH OPERATIONAL USE PROVIDES AN OPPORTUNITY TO GATHER DATA. THE RRT WILL BE ABLE TO USE THIS DATA TO REFINE AFTER EACH SPILL RESPONSE USING IN-SITU BURNING. THESE LESSONS WILL BE INCORPORATED INTO THE IN-SITU PLAN SUBMITTED TO THE FOSC.

IT IS INTENDED THAT THIS MONITORING PLAN FORM SHOULD BE COMPLETED AFTER EVERY IN-SITU BURN EPISODE. THERE IS A FORM FOR THE BURN SUPERVISORS AND ANOTHER FORM FOR THE CASUALLY TRAINED OBSERVERS TO COMPLETE. THE ACCUMULATED DATA IS TO BE SUBMITTED TOGETHER WITH THE IN-SITU BURN PLAN TO FORM THE POST BURN OPERATIONS REPORT.

BURN SUPERVISOR REPORT FORM

NAME OF BURN SUPERVISOR _____

ORGANIZATION _____

NAME OF BURN EPISODE (IE: BURN 1, BURN 2) _____

DATE AND TIME OF REPORT _____

HAS A SAMPLE OF THE OIL TO BE BURNED BEEN COLLECTED: YES NO
(ONLY ONE SAMPLE PRIOR TO THE FIRST BURN DURING AN OPERATIONAL PERIOD IS REQUIRED)

METHOD OF IGNITION:

TIME AT START OF BURN: _____

TIME AT END OF BURN: _____

WIND SPEED DURING BURN: _____

WIND DIRECTION DURING BURN:

WAS SMOKE PLUME TRAJECTORY SATISFACTORY TO AVOID CONCENTRATED AREAS OF HUMAN OR WILDLIFE POPULATIONS? YES NO

DESCRIBE THE SMOKE PLUME: (Height above water, distance, direction, dispersion, etc.)

OBSERVATION OF EFFECTIVENESS OF THE BURN:

OBSERVATION OF EFFECTIVENESS OF RESIDUAL MATERIAL COLLECTION:

IN-SITU BURNING MONITORING PLAN

IT IS INTENDED THAT THIS OBSERVER'S MONITORING REPORT BE FILLED OUT BY THOSE INDIVIDUALS WHO MAY NOT BE EXPERTS AT IN-SITU BURNING, BUT ARE IN A POSITION TO OBSERVE THE BURN AND WITNESS ITS EFFECTS.

OBSERVERS MONITORING REPORT

NAME OF OBSERVER

DATE AND TIME

NAME OF BURN EPISODE (IE: BURN 1, BURN 2)

ORGANIZATION

WAS SMOKE PLUME TRAJECTORY SATISFACTORY TO AVOID CONCENTRATED AREAS OF HUMAN OR WILDLIFE POPULATIONS?

YES

NO

COMMENTS:

GENERAL OBSERVATIONS:

IN-SITU BURN SITE SAFETY AND HEALTH PLAN				
RESPONSIBLE PARTY:			PLAN NO. : _____ (OPTIONAL)	
INCIDENT FACTS		OPERATIONAL PERIOD		
NAME: _____		FROM: _____ DATE: _____ TIME: _____		
LOCATION: _____		TO: _____ DATE: _____ TIME: _____		
DATE: _____ TIME: _____		STATUS: NEW <input type="checkbox"/> REVISED <input type="checkbox"/>		
CHAIN OF COMMAND				
DIVISION:		GROUP:		
ON SCENE COMMANDER / BURN SUPERVISOR				
<u>NAME</u>	<u>COMPANY/ORGANIZATION</u>	<u>PHONE/RADIO</u>	<u>OPERATIONAL AREA</u>	
SITE SAFETY OFFICER				
<u>NAME</u>	<u>COMPANY/ORGANIZATION</u>	<u>PHONE/RADIO</u>	<u>OPERATIONAL AREA</u>	
ON-VESSEL SAFETY SUPERVISORS				
<u>NAME</u>	<u>COMPANY/ORGANIZATION</u>	<u>PHONE/RADIO</u>	<u>OPERATIONAL AREA</u>	
SITE OPERATING COMPANIES				
COMPANY NAME / ADDRESS:				
<u>VESSEL CAPTAIN</u>	<u>PHONE/RADIO</u>		<u>NAME OF VESSEL</u>	
HEALTH & PPE REQUIREMENTS (SEE MATRIX)				
*Outer Gloves	*Face Shield	*Site Characterization	*Pre-work Medical	*Zone Control
*Inner Gloves	*Sun Hat	*Air Purifying Resp.	*40 Hr. HAZWOPER	*Security
*Rubber Boots	*Sun Tan Lotion	*Supplied Air Resp.	*24 Hr. HAZWOPER	*E/S Ent. Permit
*2/3 Body Cover	*Taped Leg Joints	*Safety Glasses	*First Aid Station	*Personnel Dept.
*Full Body Cover	*Hard Hat	*Heat Stress Program	*Shade Station	*USCG Life Vests

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

DESCRIPTION OF SITE

LOCATION OF SITE:
(Latitude / Longitude)

Latitude: _____ Longitude: _____

DESCRIPTION OF SITE:

DESCRIPTION OF
SURROUNDING AREA:

DESCRIPTION OF
SURROUNDING POPULATION:

COMMUNICATIONS MATRIX

ROUTINE COMMUNICATIONS:

COMMAND VESSEL WILL PROVIDE GENERAL COMMAND FUNCTIONS FOR BURN OPERATIONS, AND IT WILL SERVE AS THE PRIMARY COMMUNICATIONS POST. ALL RADIO FREQUENCIES WILL BE CONTINUOUSLY MONITORED BY COMMAND. PERSONNEL ABOARD THE COMMAND VESSEL, AND SAFETY PERSONNEL.

EMERGENCY COMMUNICATIONS:

AN EMERGENCY CAN BE COMMUNICATED OR DECLARED USING ANY ASSIGNED COMMUNICATIONS METHOD. ALL WORKING FREQUENCIES WILL BE MONITORED THROUGHOUT THE RESPONSE EFFORT BY THE COMMAND AND SAFETY VESSEL(S).

CONTACT LIST:

FUNCTION & NAME	PHONE NUMBER	RADIO CONTACT
OSC:		
SOSC:		
BURN SUPERVISOR:		
SITE SAFETY OFFICER:		
COMMS OFFICER:		
SSC:		
TRUSTEES:		
TRUSTEES:		

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

VESSEL LIST

NAME POSITION	VESSEL NAME	PHONE	RADIO

COMMUNICATIONS METHODS

COMMAND & CONTROL:

PRIMARY METHOD OF COMMUNICATIONS FOR THE COMMAND AND TRUSTEES GROUP IS ASSIGNED CELL PHONES. THE BURN SUPERVISOR AND COMMUNICATIONS POST SHALL ALSO HAVE CELL PHONE.

BURN & VESSEL OPS:

PRIMARY METHOD OF COMMUNICATIONS WILL BE ASSIGNED MARINE VHF CHANNEL/FREQUENCIES

- AVIATION COMMUNICATIONS BETWEEN VESSEL AND AIRCRAFT WILL BE ON MARINE CHANNEL 18A, WHICH IS 156.900 MHz.
- THE WORKING MARINE VHF CHANNEL FOR THE LEAD BOAT AND THE SECOND BOOM TOWING VESSEL SHALL BE DETERMINED PRIOR TO OPERATIONS. IN ADDITION, ALL VESSELS SHALL MONITOR MARINE VHF CHANNEL 6 THE SPILL RESPONSE DESIGNATED HAILING CHANNEL.

IN THE EVENT OF COMMUNICATIONS EQUIPMENT FAILURE:

1. A WHISTLE WILL BE USED TO INDICATE A NEED FOR ASSISTANCE.
2. THREE (3) SHORT REPEATED-BLASTS FROM VESSEL HORN SHALL INDICATE AN EMERGENCY.

GO / NO - GO POLICY

- EACH VESSEL COMMANDER (CDR), OPERATIONAL CDR, OR TRUSTEE CAN STOP THE COMMENCEMENT OR CONTINUATION OF THE BURN BASED ON THE SAFETY CONCERNS WITHIN EACH AREA OF RESPONSIBILITY.
- IMMEDIATELY PRIOR TO IGNITING THE BURN, THE FOLLOWING PERSONNEL SHALL BE POLLED TO DETERMINE GO/NO-GO STATUS. THE OSC, SOCS, BURN SUPERVISOR, SITE SAFETY OFFICER AND PARTICIPATING TRUSTEES.
- ANY OF THESE IDENTIFIED PERSONNEL MAY REQUEST TERMINATION OF THE BURN FROM THE OSC SHOULD CONDITIONS REQUIRED FOR THE BURN CHANGE AND ARE NO LONGER MET.

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

PERSONNEL RESPONSIBILITIES

BURN SUPERVISOR

- REPORTS DIRECTLY TO THE OSC.
- IS RESPONSIBLE FOR THE OVERALL BURN OPERATION, INCLUDING BUT NOT LIMITED TO: IGNITION AND TERMINATION, PRE-IGNITION CHECKLIST, GO/NO-GO POLLING OF DESIGNATED PERSONNEL, SAMPLE TAKING AND RECORD KEEPING.
- IS THE DESIGNATED BOOM COMMANDER.

SITE SAFETY OFFICER

- REPORTS DIRECTLY TO THE BURN SUPERVISOR
- IN CHARGE WITH THE OVERALL RESPONSIBILITY OF ENSURING WORKER HEALTH AND SAFETY DURING BURN OPERATIONS.
- CONDUCTS PREBURN SAFETY BRIEFING ON OPERATIONAL PROCEDURES AND GOALS.
- IDENTIFIES POTENTIAL EMERGENCIES.
- COORDINATES IMPLEMENTATION OF THIS PLAN.
- ASSIGNS AND MONITORS ALL ASSOCIATED SAFETY PERSONNEL.

VESSEL RESPONSIBILITIES

COMMAND VESSEL

- SHALL SERVE AS THE ON-SITE COMMAND AND COMMUNICATIONS POST.
- BURN SUPERVISOR AND OSC SHALL CONDUCT BURN OPERATIONS FROM THIS VESSEL COMMAND POST.
- SHALL BE APPROPRIATE IN SIZE AND MANNING TO SERVE AS OPERATIONS COMMUNICATIONS AND COMMAND PLATFORM.
- SHALL SERVE AS THE LEAD BOOM TOWING VESSEL.

SAFETY BOAT

- MONITORING AND MAINTAINING FIRE FREE ZONES
- TASKED WITH FIRE WATCH AND MAINTAINING A LIMITED FIRE FIGHTING CAPABILITY.
- ASSISTS WITH BURN OBSERVATION AND EFFECTIVENESS MONITORING.
- TASKED WITH DEBRIS RECOVERY.

IN-SITU BURN SITE SAFETY AND HEALTH PLAN	
OPERATIONAL OBJECTIVES	
1	OPERATE IN COORDINATION WITH THE COMBINED ICS TO COORDINATE BURNING ACTIVITIES WITH ALL OTHER OFFSHORE/NEARSHORE RESPONSE OPERATIONS.
2	PERFORM ON-WATER IN-SITU BURNING OPERATIONS IN ACCORDANCE WITH THE IN-SITU BURNING PLAN.
3	ON-WATER FLOTILLA IS TO AVOID THE SMOKE PLUME DURING IN-SITU BURNING OPERATIONS.
SITE CONTROL	
-	SITE CONTROL DESCRIPTION: THE MAIN WORK DECK OF THE VESSELS IS THE EXCLUSION ZONE DURING ACTIVE OIL SPILL OPERATIONS. THE OTHER SECTIONS AND DECKS OF THE VESSEL ARE SUPPORT AREAS. SITE CONTROL MAP: SEE ATTACHMENT 1
SITE SECURITY	
-	THE CAPTAIN OF THE VESSEL IS RESPONSIBLE FOR VESSEL SECURITY. ON WATER BURN ZONE SECURITY WILL BE IMPOSED AND CONTROLLED BY THE U.S. COAST GUARD
SITE CHARACTERIZATION AND MONITORING	
EXPOSURE POTENTIAL:	
-	ZONE CONTROL WILL BE ESTABLISHED PRIOR TO ENTERING A RESPONSE AREA DEPENDING ON THE SPILL EXPOSURE POTENTIALS INCLUDING: TBX (BENZENE), H ₂ S (HYDROGEN SULFIDE) AND LEL (LOWER EXPLOSIVE LIMIT)
-	NO ENTRY INTO AN EXCESSIVE TBX (BENZENE), H ₂ S (HYDROGEN SULFIDE)
-	ENTRY INTO AN EXCESSIVE BENZENE ENVIRONMENT MAY BE CONSIDERED FOR SPECIAL PURPOSES IN COMPLIANCE WITH APR/SAR REGULATIONS
-	DURING IN-SITU BURN ACTIVITIES, ALL PERSONNEL WILL HAVE APR'S AVAILABLE.
REQUIRED CHARACTERIZATION TESTING:	
-	TBX (TEST FOR BENZENE), H ₂ S AND LEL TESTING ARE MINIMUM REQUIREMENTS
-	SEE PAGE 3 FOR FIELD CHARACTERIZATION CHECKLIST
EXPOSURE LIMITS:	
BENZENE:	NIOSH HAS IDENTIFIED BENZENE AS AN OCCUPATIONAL CARCINOGEN. EXPOSURES SHOULD BE LIMITED TO THE LOWEST FEASIBLE CONCENTRATION.
H ₂ S:	OSHA PEL - 10 ppm, IDLH - 300 ppm
O ₂ :	10% PEL = PERMISSIBLE EXPOSURE LIMIT
O ₂ :	>19.5% <21.5% STEL = SHORT TERM EXPOSURE LIMIT
	IDLH = IMMEDIATELY DANGEROUS TO LIFE AND HEALTH
REQUIRED MONITORING:	
AFTER SITE CHARACTERIZATION, BENZENE, H ₂ S AND LEL WILL BE MEASURED ONCE PER HOUR UNLESS:	
1	ANY MEASUREMENT REFLECTS A REASONABLE POSSIBLE POSSIBILITY THAT AN STEL WILL BE REACHED. AT THIS TIME, CONTINUOUS MONITORING WILL TAKE EFFECT
2	THE SITE SAFETY OFFICER AND ON SCENE COMMANDER DECIDE THAT MONITORING INTERVALS SHOULD BE ALTERED BASED ON THEIR JUDGMENT FROM PRIOR READINGS AND CONTINUOUS JOB SITE ASSESSMENT.

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

EMERGENCY PROCEDURES

EMERGENCY FIRE PROCEDURE

A FIRE EMERGENCY SHALL INCLUDE ANY NON CONTROLLED BURNING WITHIN THE BURN OPERATION AREA.

- THE SITE SAFETY OFFICER OR OTHER QUALIFIED INDIVIDUAL MUST:
 - 1 TAKE CHARGE OF THE SITUATION.
 - 2 NOTIFY BURN SUPERVISOR OF THE EMERGENCY.
 - 3 NOTIFY FIRE DEPARTMENT AND SAFETY BOAT OF TYPE OF ASSISTANCE NEEDED.
 - 4 SOUND APPROPRIATE FIRE SIGNAL. (THREE (3) BLASTS OF A HORN).
- THE BURN SUPERVISOR WILL ENSURE THAT THE FIRE IS EXTINGUISHED PRIOR TO RESTARTING BURN OPERATIONS.

EMERGENCY TERMINATION OF BURN

- IN THE EVENT THAT THE FUNDAMENTAL SAFETY CONDITIONS CHANGE OR AN EMERGENCY SITUATION ARISES AFTER INITIATION OF THE BURN, THE FOLLOWING METHODS MAY BE USED TO TERMINATE THE BURN:
 - 1 RELEASING THE TOW LINE FROM ONE OF THE TOW VESSELS WHILE THE OTHER TOW VESSEL MOVES AHEAD AT SEVERAL KNOTS.
 - 2 MOVE BOTH VESSELS AHEAD AT SEVERAL KNOTS FORCING THE OIL BENEATH THE BOOM AND REMOVING IT FROM THE COMBUSTION ZONE.
- ALTHOUGH THE OSC HAS OVERALL BURN TERMINATION AUTHORITY, ANY DESIGNATED SAFETY SUPERVISOR MAY REQUEST THE BURN BE TERMINATED.

EMERGENCY MEDICAL PROCEDURES

- WHEN A PERSON IS INJURED, THE SITE SAFETY OFFICER OR OTHER QUALIFIED PERSONNEL MUST:
 - 1 TAKE CHARGE OF THE SITUATION
 - 2 PROVIDE NECESSARY DECONTAMINATION
 - 3 ADMINISTER FIRST AID
 - 4 ARRANGE FOR ADDITIONAL MEDICAL ASSISTANCE AS NECESSARY
 - 5 IF A SERIOUS INJURY OR LIFE THREATENING CONDITION EXISTS, NOTIFY THE USCG OPERATIONS CENTER AT SECTOR SAN FRANCISCO BAY **(510) 437-3073**
SECTOR LOS ANGELES/LONG BCH **(562) 980-4444** OR
SECTOR SAN DIEGO **(619) 683-6470**

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

STANDARD PROCEDURES FOR REPORTING EMERGENCIES

WHEN CALLING FOR ASSISTANCE IN AN EMERGENCY, PROVIDE THE FOLLOWING INFORMATION:

- YOUR NAME
- LOCATION
- TELEPHONE NUMBER AT YOUR LOCATION
- NAME OF PERSON(S) EXPOSED OR INJURED
- ACTIONS ALREADY TAKEN

EMERGENCY RESPONSE RESOURCES

AMBULANCE

IN AN OFFSHORE EMERGENCY, EITHER A LOCAL WATER TAXI COMPANY OR THE U.S. COAST GUARD SEARCH AND RESCUE CENTER WILL PROVIDE TRANSPORTATION TO THE NEAREST AMBULANCE/MEDICAL FACILITY. DUE TO THE TRANSIENT NATURE OF THIS OPERATION. THE SITE SAFETY OFFICER WILL CONTINUOUSLY RESEARCH AND LOCATE THE NEAREST AMBULANCE SERVICE BASED ON PRESENT LOCATION.

FIRE DEPARTMENT

DEPENDING ON THE SITE LOCATION, **DIALING 911** MAY SUFFICE FOR FIRE DEPARTMENT CONTACT.

A FIRE BOAT WILL RESPOND INSIDE OF AND UP TO _____. OUTSIDE OF _____.
IF THE EMERGENCY IS OUTSIDE OF THIS AREA, CALL THE U.S. COAST GUARD AT
(_____) _____ - _____

OIL SPILL RESPONSE

FOR ADDITIONAL RESPONSE ASSISTANCE, CALL:

HOSPITAL/EMERGENCY MEDICAL

SINCE ON-WATER OIL SPILL OPERATIONS ARE TRANSIENT, THE SITE SAFETY OFFICER WILL CONTINUOUSLY RESEARCH AND LOCATE THE NEAREST HOSPITAL/EMERGENCY MEDICAL FACILITIES BASED ON PRESENT LOCATION. _____ BURN CENTER IS THE BEST LOCATION IN NORTHERN CALIFORNIA FOR BURNS

EMERGENCY PHONE NUMBERS

U. S. COAST GUARD		LOCAL FIRE DEPARTMENT	
LOCAL POLICE DEPARTMENT		POISON CONTROL CENTER	
STATE OF CALIFORNIA OFFICE OF EMERGENCY SERVICES	(800)852-7550	NATIONAL SPILL RESPONSE 24 HR. REPORT HOTLINE	(800) 424-8802
USCG SEARCH AND RESCUE		CHEMTREC (24 HOUR)	(800) 424-9300

IN-SITU BURN SITE SAFETY AND HEALTH PLAN

THERMAL STRESS REDUCTION PROGRAM

OPERATIONAL REQUIREMENTS

TO REDUCE THE EFFECTS OF HEAT STRESS, 2/3 SLICKER BOTTOMS ARE A STANDARD REQUIREMENT. UPPER TORSO EXPOSURE IS MINIMAL DURING NORMAL OPERATIONS. DURING OVERHEAD OPERATIONS WITH DRAPING OIL OR WHEN SPLASHING OCCURS FULL PPE WILL BE WORN

TO FURTHER REDUCE THE POSSIBILITIES OF HEAT STRESS, SUN SHADE HATS IS MANDATED ON THE VESSEL'S WORK DECK DURING LIFTING OPERATIONS. HOWEVER, THE WEARING OF HARD HATS IS MANDATED ON THE VESSEL'S WORK DECK DURING LIFTING OPERATIONS.

- HAZWOPER COLORS WILL BE ENFORCED FOR ALL HATS:
 - GREEN HAT = 24 - 48 HOURS
 - YELLOW HAT = 4 - 23 HOURS
 - WHITE HAT = NO HAZWOPER TRAINING OR NOT CURRENT WITH APPLICABLE REFRESHERS
- ABOVE 85 DEGREES (F) EITHER COOLING VESTS OR TIME LIMITATIONS WILL BE IMPLEMENTED TO REDUCE HEAT STRESS.

HAZARD REDUCTION PROCEDURES

PRIOR TO THE VESSEL DISPATCHING FROM THE PIER, THE SHIP'S CAPTAIN (OR DESIGNATE) WILL GIVE ON-BOARD PERSONNEL A PREDEPARTURE SAFETY BRIEFING CONCERNING THE VESSEL.

PRIOR TO BEGINNING ANY ON-SITE IN-SITU BURNING WORK, THE SITE SAFETY OFFICER WILL GIVE A SITE & JOB SPECIFIC SAFETY BRIEFING TO ALL WORKERS ON BOARD THE VESSEL.

NOTIFICATION AND DISTRIBUTION

UNITED STATES COAST GUARD
SECTOR SAN FRANCISCO BAY
BLDG 14 COAST GUARD ISLAND
ALAMEDA, CA 94501-5100
510-437-3073

PLAN APPROVALS

RESPONSIBLE PARTY:

(Signature)

(Date)

UNITED STATES COAST GUARD:

(Signature)

(Date)

STATE OF CALIFORNIA DEPT. OF HEALTH:

(Signature)

(Date)

PLAN PREPARER:

(Signature)

(Date)

IN-SITU BURN SITE SAFETY AND HEALTH PLAN FIELD SITE CHARACTERIZATION CHECKLIST

DATE: _____ **TIME:** _____

LOCATION: _____

TYPE OF PETROLEUM INVOLVED: _____

SPECIAL IN-SITU BURNING CONSIDERATIONS:

THE OBJECTIVE IS TO AVOID THE SMOKE BY-PRODUCTS OF IN-SITU BURNING. KEEP VESSELS AND PERSONNEL UPWIND OF THE SMOKE PLUME. THIS IS ALSO THE BASIC PRECAUTION REQUIRED FOR EMITTED GASES. STUDIES SHOW THAT THE DANGER FROM GASES EMITTED DURING IN-SITU BURNING REMAIN SIGNIFICANTLY BELOW EXPOSURE UNITS. SUCH EMISSIONS CAN INCLUDE SULFUR DIOXIDE (SO₂) (PEL = 0.2 ppm), NITROGEN DIOXIDE (NO₂) (PEL = 0.1ppm), AND CARBON MONOXIDE (CO) (PEL = 35ppm). IT IS INTENDED THAT BY AVOIDING THE SMOKE THESE POSSIBLE EMISSIONS WILL NOT BE A PROBLEM.

PERSONAL PROTECTIVE EQUIPMENT:

DURING ACTIVE IN-SITU BURNING OPERATIONS APR'S SUITABLE FOR BOTH ORGANIC VAPORS AND PARTICULATES SHALL BE WORN BY ALL PERSONS ON VESSELS IN PROXIMITY TO THE SMOKE

<input type="checkbox"/>	Outer Gloves	<input type="checkbox"/>	Face Shield	<input type="checkbox"/>	Rubber Boots	<input type="checkbox"/>	Taped glove gauntlets
<input type="checkbox"/>	Inner Gloves	<input type="checkbox"/>	Hard Hat	<input type="checkbox"/>	Taped Leg Joints	<input type="checkbox"/>	USCG PFD
<input type="checkbox"/>	2/3 Body Cover	<input type="checkbox"/>	Sun Hat	<input type="checkbox"/>	Air Purifying Resp.	<input type="checkbox"/>	Safety Glasses
<input type="checkbox"/>	Full Body Cover	<input type="checkbox"/>	Sun Tan Lotion	<input type="checkbox"/>	Supplied Air Resp.	<input type="checkbox"/>	Benzene Monitors

MONITORING EQUIPMENT

Industrial Scientific Model MX 251 Gas Detector for LEL and O
AIM Model 3350 Gas Detector for H₂S
PHOTOBAC "SNAP SHOT" PORTABLE GAS CHROMATOGRAPH for Benzene

LEL EXPLOSIVE VAPORS

USING THE MX 251, MEASURE THE LOWER EXPLOSIVE LIMITS.
READING MUST BE LESS THAN 10%

LEL = _____

H₂S -HYDROGEN SULFIDE:

USING THE AIM GAS DETECTOR, MEASURE THE CONCENTRATION OF H₂S.

H₂S = _____

BENZENE (TBX)

USING THE "SNAP SHOT" GC, MEASURE OF THE CONCENTRATION OF BENZENE. READING MUST BE LESS THAN 1 ppm.

BENZENE = _____

IN-SITU BURN BOOM OPERATIONS PROCEDURES

PRE-IGNITION CHECKLIST

COMMUNICATIONS OFFICER WILL:

- ☐ Perform radio check with each vessel and participating trustee.
- ☐ Verify each vessel is aware of burn trajectory and time of ignition.

BURN SUPERVISOR WILL:

- ☐ Verify clear burn path from aircraft.
- ☐ Ensure boats and booms are pointed upwind.
- ☐ Designate oil-free safe area for vessels in case of emergency.
- ☐ Obtain final burn approval from FOSC.

BOOM TOWING SAFETY INSTRUCTIONS

1. Contained oil should be ignited only after the requirements for Tab d to Annex X of the In-Situ Burn L.O.A. and pre-ignition and operational checklist are met, and confirmed by all key participants via radio link.
2. All vessels must remain at least (5) fire diameters from the flame perimeter.
3. When using six hundred and sixty feet (660 ft.) or less of boom, use tow lines equal to the length of the boom. For boom longer than six hundred and sixty feet, tow lines may be less than the length of the boom.
4. Prior to ignition, ensure that all personnel on-site are positioned upwind or cross-wind from the target slick.
5. Prior to ignition, ensure that all personnel on-site are positioned upwind or cross-wind from the target slick.

FIRE CONTROL

BURN SUPERVISOR WILL BE POSITIONED ON THE COMMAND VESSEL.

HE/SHE WILL:

- ☐ Control the burn rate by coordinating boom towing vessels' forward velocity.
(Burn rate is dependent upon oil layer thickness)

IN-SITU BURN BOOM OPERATIONS PROCEDURES

BURN EFFECTIVENESS MONITORING

SITE SAFETY OFFICER WILL BE POSITIONED ABOARD A DEDICATED SAFETY VESSEL. HE WILL:

- ☐ Assist the command vessel with monitoring the burn's effectiveness
- ☐ Monitor the status of the burn in relation to the proximity of the burn to towing vessels and other response vessels.
- ☐ Monitor and maintain pre-designated "fire-free" zones between response vessels or between the burn and specified sensitive areas.
- ☐ Provide backup support for deployment and containment operations.
- ☐ Provide extra personnel and equipment, where needed.

TERMINATION OF BURN AND EMERGENCY TERMINATION OF BURN

In most circumstances, the FOSC should plan to allow an oil slick to burn to completion once it has ignited. However, premature termination of a burn may be necessary if the wind or weather shifts unexpectedly, or if secondary ignition of another slick is a possibility.

As part of the **GO/NO-GO POLICY**, the Burn Supervisor, Site Safety Officer, participating Trustees or designated safety personnel may stop the response effort by declaring an emergency.

If an emergency is declared, the person declaring the emergency will:

- ☐ Provide description of the problem to the Burn Supervisor and FOSC.

FOSC will determine the course of action.

If the burn is terminated, Burn Supervisor will:

PRIMARY METHOD

- ☐ Order one of the towing vessels to release the tow line from the vessel
- ☐ Order the other towing vessel to move ahead at several knots. (Oil will spread quickly to a thickness that cannot support combustion.)

SECONDARY METHOD

- ☐ Order both vessels to move ahead at several knots. (Oil will be forced beneath the boom, removing it from the combustion zone.)

APPENDIX – F OF ISB LOA
RESOLUTION OF QUESTIONS RE ISB LOA
RRT, REGION IX-MAINLAND

This information was agreed upon in an RRT Meeting in Novato, CA October 30-31, 1996; and the details are to accompany the LOA.

(1) Geographical Boundaries (Page Two of the LOA). Designation of area covered by the Letter of Agreement: 35-200 nautical miles from the Mainland Coast of California. This does not mean 35 nm from the shoreline of islands. It will be up to the FOSC to determine whether there is any unprotected human population on an island, which may be within this zone. If there were to be such a person (s), then monitoring would need to be done to assure that the limits were not exceeded.

(2) There have been no specific comments from NOAA or DOD regarding any additional specifics for land within their jurisdictions. It will be assumed that for any geographical entity within the zone covered by the LOA, the judgment of the FOSC and the restrictions itemized in the LOA will be sufficient protection for these geographical entities.

(3) Appendices B-E are still given as examples of the type of document which should be developed if an in situ burn were to be done. The RRT signatory agencies do not expect to see such a document in advance of the burn, but they do expect that the pertinent information would be developed, that the FOSC or his designee would review it, and that the FOSC report would contain all the pertinent information.

(4) A statement will be added to the LOA that it will be reviewed annually and updated
as appropriate.

(5) Specific comments were received from the US Coast Guard-Strike Force Coordination Center (marked “**”). RRT response follows (marked “**”).

* 1. "Guidelines paragraph 2 note conditions that allow the FOSC to conduct a burn without concurrence from other Federal officials, yet this appears to be contradicted by the go/no-go discussion in Appendix IV."

**Appendix D is an example of a Site Safety Plan. It is assumed that the FOSC will approve all aspects of the operation of the ISB. The go/no-go decision would be up to the FOSC and the details of an approved ISB operation would be the subject of an aftermath report (the FOSC Report), which will be made available to the RRT.

*2. "Guidelines paragraph 4 indicate wind patterns will be predicted by the NOAA SSC. The National Weather Service or military weather personnel may also be useful and provide added flexibility in this ... regard. "

**True. The NOAA SSC works for the FOSC and gathers necessary information from a number of sources. These are useful suggestions.

*3. "Guidelines paragraph 5 indicates the existence of protocol for observing and halting the burn in Appendix C, however Appendix C ... does not have sufficient monitoring detail and does not appear to be based on the Special Response Operations Monitoring Program. The monitoring paragraph of the Documentation, Monitoring and Evaluation Section also refers to Appendix III for monitoring details that are not there. Also, in one of these sections there should be some clarification as to who is monitoring for what. The USCG may be doing effectiveness monitoring and others may be interested in effects monitoring."

****True.** The entire operation is under the purview of the FOSC. Individual monitoring activities, pertinent to the specific ISB situation would be described in the Monitoring Plan, which would be drawn up specifically for the ISB being undertaken. Appendix III in this LOA is an example developed by Oceania RRT participants. The case-specific information and Plans would be available after the ISB, for RRT review in the FOSC Report.

*4. "Guidelines paragraph 8 should be more specific as to what are trained professionals and recognized techniques/technologies."

****This is left initially to the judgment of the FOSC.** The RRT can review the specifics in the FOSC Report and determine whether more clarification should be given in advance. If the decision were to give more clarification, then this guidance would be part of the update of the LOA.

*5. "Guidelines paragraph 9 should be more specific as to what is necessary for rapid controlling and stopping of the burn."

****This is left initially to the judgment of the FOSC.**

*6. "Appendix A, Overview, Safety Concerns, Vessel Safety Section should address the use of safety zones and broadcast notice to mariners as a means to increase overall vessel safety

****These operational concerns are left up to the FOSC.**

*7. "Appendix I, Overview, Safety Concerns, the entire section should be cross-checked against the hazards listed in Appendix D to ensure all are appropriately discussed (e.g. H₂S discussed in Appendix D but not in Appendix A; Polynuclear Aromatic Hydrocarbons discussed in Appendix A but not in Appendix D)."

****Human Health & Toxicity Concerns Section of Appendix A contains some general language which includes these noted compounds - "chemical content of the smoke plume is one reference, and "sulfur dioxide ... produced by oil combustion" is another. Appendix A is meant as a broad overview of the risks and the tradeoffs; specific details are found in the Safety and Monitoring Appendices, which would be developed, in a specific ISB application, conducted under the overview of the FOSC.**

*8 " Appendix B, In-situ Burning Plan, the following details should be added: (1) People and equipment resources to conduct the burn; (2) Command and control issues; (3) Communications; (4) Backup mechanical containment and recovery measures."

****These operational details would be developed in a case-specific plan for the ISB actions which the FOSC overviews.**

*9. Appendix B, recommend "Weather & Water 24 Hour Forecast" section be reworded to

"Marine Weather 24 Hour Forecast."

****OK - since Appendix B is an example, the changed language can be part of the example.**

*10. "Appendix B, "Estimated Smoke Trajectory: With all the computer models capable of predicting plume behavior available, recommend one or more be used and referenced in the Plan."

****OK - this would be up to the FOSC, and the NOAA SSC would most likely be using these as part of the NOAA-provided support.**

*11. "Appendix D appears to be a good, comprehensive site safety and health plan that has significantly more detail than the Burning Plan and the Burn Monitoring Plan. Normally these two plans would generate the concerns that drive the site safety plan. Recommend that the site safety plan be used to work backwards and flesh out the Burning and Burn Monitoring Plans. Recommend the drafters of this document contact the NRT S&T subcommittee to achieve standardization and common benefit from these two development efforts."

**Noted. These appendices are examples only.

*12. A number of specific comments were made by the USCG reviewer on improvements to the Site Safety and Health Plan. These are listed without comment, since this Appendix is given as an example of a site safety plan, which would be developed for each specific ISB application.

Use term "personal Flotation Device: in lieu of "USCG Life Vest" in PPE Requirements section;

Add OSHA PEL (TWA) for Benzene (1 ppm) in Exposure Limits section;

List/explain PAH hazards in Exposure Potential section (as mentioned in Appendix I Overview);

Use term "explosive/flammable gases" vs. "LEL" as the Exposure Potential (since LEL is the exposure limit for those hazards);

Exposure Limit for "explosive/flammable" gases should be written as "less than 10% of the LEL";

Add "reading must be less than 10 ppm" under H₂S monitoring section;

Plan Approvals Section, wrong use of "IT'S", delete word, and add "representative: following the agency (not under the blank itself), recommend use the term "Federal On-Scene Coordinator (FOSC)" here (as mentioned in Purpose section of LOA);

What does "E/S Ent. Permit" mean under Health & PPE Requirements section (confined space entry permit?). need to clarify/re-word-,

Why are PPE requirements repeated in two sections of the plan (in Health & PPE Requirements section and in PPE section, which also adds more detail on APR cartridges, which is important); recommend just list overall "Safety & Health Concerns" in the matrix listing "PPE" as one concern and referencing the later more detailed section on PPE, which should also include INFO on glove/boot/splash suit materials suitable for oil spill contaminants."

(10) Comments were received from the USCG-SECTOR San Diego and are marked "(*)". RRT reply is marked "(*)".

*1. Appears that the 35-200 mile pre-approved zone needs further discussion. What is the Boundary for islands within the 35-200 mile zone. In the San Diego AOR the greatest potential for a significant offshore discharge is in the "gasoline alley" where the Navy does unrep, and in the Chevron Lightering zone. Both are within 35 miles of San Clemente Is."

**The pre-approval zone is 35-200 nautical miles off the mainland coast of California. It would appear that the pre-approval zone would include these risk areas. The FOSC would need to assure that the unprotected human population exposure limits were not exceeded.

*2. "It appears there would never be a time when the 3 criteria would not be met in the 35-200 zone barring any islands. Are these three criteria really established for determinations when within 35 miles or close to islands?"

**The proximity to islands issue was discussed previously. The three criteria are: (1) ISB is a viable option for oil removal; and (2) exposure limits for unprotected human population will not be exceeded; and (3) the plume or heat from the burn will not result in greater impact to sensitive wildlife resources than would the spilled oil. There might be instances in which any or all of these criteria could not be met, and then the ISB would not be pre-approved. For example, there might be other vessels in the area, with unprotected human populations, which might be exposed to the plume. Another example - the oil might not be burnable or weather conditions might not be appropriate, or the available equipment might be lacking in order to effect a safe burn operation.

*3. "We are assuming that "population" excludes response personnel, other vessels, and aircraft for the purpose of evaluating the particulates downwind. If so we will probably never have to make the calculation. If we have to make the calculation as stated in the LOA, we lack the tool to do that."

**If the calculation being discussed is the measurement for particulates, then it is important that the FOSC or his designee work with NOAA to develop the protocol for monitoring and then assure that within the Incident Command System (ICS) there is a way for this monitoring to be done - either through contract or through one of the units of the ICS (the Pacific Strike Team of the USCG might be one possibility). The test is to monitor for particulates of a stated size and concentration at the breathing zone of potentially affected humans.

(11) Comments were received from MMS, marked "**", and RRT reply is marked "***".

*1. "Page 1, paragraph 4 - Language in the text should specify where monitoring of the smoke plume should take place to prevent exposure to the plume. We suggest following the Newfoundland Oil Burn Experiment Protocols to prevent exposure. We also suggest the use of smoke plume air models such as the one developed by the National Institute of Standards and Technology to predict the direction the smoke plume will travel."

** It is not clear to which section this comment may pertain, since there is no paragraph 4 on page 1. However the thoughts may be useful suggestions to those preparing case-specific plans.

*2. "Appendix A, page 2. "Safety Concerns", 3. Vessel Safety:. We suggest including language regarding vessels which may be used to apply additives (Enhanced Burn Additives, emulsion breakers, etc.) to the contained oil slick prior to and possibly during the burn."

**This is an operational suggestion, which will be noted for the use of those preparing case-specific plans. Appendix I is meant to be a narrative summary of ISB as an oil spill response tool. This same comment applies to further statements about Appendix I.

*3. "Appendix A, page 2, "Safety Concerns" 3. Vessel Safety. We suggest adding language regarding the access of boat traffic, turning radius restrictions and the downwind restricted zones due to the VOSS and ROGs generated by the burning of a large oil slick."

*4. "Appendix A, page 2, "Safety Concerns: This section does not mention the measures to be taken in case of crude oils containing H₂S, speed of the oil/gas separation, flammability and toxicity (MMS requires 15 ppm H₂S as the lower threshold of platform restriction/evacuation preparedness"

*5. "Appendix A, page 2, "Safety Concerns". We suggest a sentence concerning SO_x and H₂S that explain the behavior and related hazards from their characteristics. We suggest mentioning the importance of using a spark arrestor.

*6. "Appendix A, page 2, "Safety Concerns. The Section should include a paragraph regarding aircraft. It should specify the working ceiling for fixed wing and other aircraft for each work phase, i.e., mapping over flights, laser beam ignition, dispersant spraying, sample taking and aerial coordination of program phases (including wind monitoring and traffic coordination upwind and downwind)."

*7. "Appendix A, page 2, item 5. Emulsification - Emulsification is very different from weathering. Evaporation of an oil's light ends and the onset of water-in-oil emulsion formation in an oil slick often signals the closing of the window of opportunity for in-situ burning as a countermeasure. Water content in excess of 25 percent in a stable emulsion generally precludes ignition of the slick Application of an emulsion breaker can significantly extend the window of opportunity for in-situ burning."

*8. "Appendix A, page 3, second paragraph. Polynuclear Aromatic Hydrocarbons (PAH). We suggest to include and explain the fate of PCH also, because both PAH and PCH dilute rapidly as the smoke disperses."

**There is a statement in this section, which observes that concentrations decline downwind.

*9. "Appendix B, Weather and Water Conditions - We question the need to include tides in a burn plan for 35-200 miles offshore. Tides affect the nearshore environment."

**This is true. Appendix B details are given as an example, which was developed for the Oceania RRT jurisdiction. We expect that an IN-SITU BURNING PLAN will be developed for each case-specific application and that the FOSC will approve it. The RRT will see the details, after the fact, when the FOSC Report is circulated

RRT Contact List

Name/Agency	Contact Number
A. Environmental Protection Agency	
EPA Alternate 1:	
Dan Meer	415-972-3132
Bill Robberson	415-972-3072
B. United States Coast Guard	
CAPT Swanson	510-437-5754
USCG Alternate 1:	
CDR Susan Krala	510-437-2794
C. Department of the Interior	
Pat Port	510-817-1477
	Cel: 510-420-0524
DOI Alternate:	
Regional Environmental Assistant (TBD)	

DOI Alternate:

Regional Biologist:

California Jim Hass

916-978-5603

D. Department of Commerce

NOAA

415-561-6624

206-499-1118

HAZMAT Duty Officer

206 526-6317

E. California Department of Fish and Game/OSPR

Mike Sowby

916-324-7629

916-323-0716

State Alternate 1:

Yvonne Addassi (in-situ burning)

916-324-7626

F. NOAA/HAZMAT

Scientific Support Coord.

206 526-6317

G. Office of Emergency Services

Trevor Anderson

916-845-8788

Local Air Pollution Control District Contact List

Mr. Wayne Morgan North Coast Unified AQMD 2300 Myrtle Avenue Eureka, California 95501-3328 (707) 443-3093 FAX (707) 443-3099	Mr. David Faulkner Mendocino County APCD Courthouse 306 East Gobbi Ukiah, California 95482 (707) 463-4354 FAX (707) 463-5707
Mr. James Guthrie Director of Enforcement Bay Area AQMD 939 Ellis Street San Francisco, California 94109 (415) 749-4979 FAX (415) 928-8560	Ms. Barbara Lee Northern Sonoma County APCD 109 North Street Healdsburg, California 95448 (707) 433-5911 FAX (707) 433-4823
Mr. Fred Thoits Monterey Bay Unified APCD 24580 Silver Cloud Court Monterey, California 93940 (408) 647-9411 FAX (408) 647-8501	Ms. Karen Brooks San Luis Obispo County APCD 3433 Roberto Ct. San Luis Obispo, California 93401-7148 (805) 781-5912 FAX (805) 781-1035
Mr. Ron Tan Santa Barbara County APCD 26 Castilian Drive, B-23 Goleta, California 93117 (805) 961-8800 FAX (805) 961-8801	Mr. Kent Field Ventura County APCD 669 County Square Drive Ventura, California 93003 (805) 662-6960 FAX (805) 645-1444
Mr. Mohsen Nazemi South Coast AQMD 21865 East Copley Drive Diamond Bar, California 91765 (909) 396-2662 FAX (909) 396-3341	Ms. Teresa Morris San Diego County APCD 9150 Chesapeake Drive San Diego, California 92123-1096 (619) 694-3342 FAX (619) 694-2730

References

1. ATSDR (Agency for Toxic Substances and Disease Registry). 1991. Preliminary health advisory related to burning oil wells in Kuwait. In-situ Burning Workshop. May 1991.
2. Campagna, P.R. & Humphrey, A. 1992. Air Sampling and Monitoring at the Kuwait Oil Well Fires. In Proceedings of the Fifteenth Arctic and Maine Oil Spill Program Technical Seminar. June 1992.
3. Evans, et al. Burning, Smoke Production, and Smoke Dispersion from Oil Spill Combustion, Proceedings of the Eleventh Arctic and Marine Oil Spill Technical Seminar, Vancouver, British Columbia, Canada. June 1988
4. Evans, D., et al. 1992. Smoke Plumes from In-Situ Burning of Oils. National Institute of Standards and Technology.
5. Ferek, et al. 1992. Chemical Composition of Emissions from the Kuwait Oil Fires. Journal of Geophysical Research; 97: 14483-14489.

6. Gonzalez, et al., 1994. Texas Marsh Burn Removing Oil from a Salt Marsh using In-Situ Burning. In-situ Burning Oil Spill Workshop, Florida.
7. National Research Council. 1989. Using Oil Spill Dispersants on the Sea. National Academy Press, Washington D.C. 335 pp.
8. S.L. Ross Environmental Research LTD. 1990. "Evaluation of Capabilities to Respond to Large Oil Spills in California Marine Waters". Prepared for the California State Interagency Oil Spill Committee.
9. Sharratt, M. and M. Butler. 1992. Toxicological effect of oil smoke. In The Environmental and Health Impact of the Kuwaiti Oil Fires, Proceedings of an International Symposium, October 1991.
10. Shigenaka, G. & N. Barnea. 1993. Questions about In-situ Burning as an Open-Water Oil Spill Response Technique. National Oceanic and Atmospheric Administration. HAZ-MAT Report 93-3; June 1993.

INCIDENT SPECIFIC RRT APPROVAL FOR BURNING USE

IN-SITU BURNING

BACKGROUND

There are presently two commonly recognized approaches to remove significant quantities of spilled petroleum from marine surface waters. The most common technique involves mechanical skimming devices which, for large spills, typically remove less than 20% of the spilled petroleum (National Research Council, 1989). The second and more controversial method is the use of chemical agents (e.g., dispersants) to disperse oil into the water column. The effectiveness of chemical dispersants has been reported to range from zero to 100% depending on the type of petroleum spilled, the dispersant used, and the approach employed to estimate effectiveness (National Research Council, 1989).

Burning has distinct advantages over other oil spill countermeasures. It offers the potential to rapidly convert large quantities of oil into its primary combustion products with a small percentage of other unburned and residue byproducts (Evans et al., 1992). This technique could be the most effective of all in dealing with a large spill at sea and in removing large quantities of oil from the water environment before it comes ashore (S.L. Ross Environmental, 1990). Until recently, this response technology has not been regularly used, due largely to the lack of understanding of the combustion products and the principles governing the combustibility of oil-on-water (Evans, et al., 1992) as well as the lack of the equipment necessary to carry out a burn within the window of opportunity. Much of the renewed interest in in-situ burning has resulted from years of study of both the dynamics of burning oil on the water and the combustion products produced during an in-situ burn.

In-situ burning removes the surface oil by driving much of it into the atmosphere in the form of combustion gases and soot. As such, in-situ burning reduces the environmental threat and impacts posed by on-water spills but only at the cost of increasing the potential threat posed by the airborne plume. In-situ burning, however, does have the potential to accelerate cleanup of spilled petroleum on the surface of the water and at the same time reduce the risk of petroleum-related impacts on environmentally sensitive areas. In the case of California, environmentally sensitive areas include the productive intertidal regions, tidal inlets, tidal marshes and other wetland areas of the coastal islands and mainland, and the surface waters where endangered marine mammals and large concentrations of sea birds might exist. The problem for decision makers is to compare the effects of burning versus not-burning and choose the option that provides the greatest net benefit to the environment, without causing undue public health impacts. Every oil spill situation is unique. Weather and seastate conditions that are most favorable for mechanical cleanup (calm winds and seastate), are not favorable for dispersants. However, dispersants might be the best response option in remote off-coast areas with choppy seas. Although limited by the ability to contain oil, in-situ burning might be the best option in areas where it is imperative to remove large quantities of oil quickly to protect on-water resources (such as in the sea otter range or the Farallon Islands). It is important that all response options be available for use at the time of a spill so that the best, most appropriate response can be used.

REGIONAL PHILOSOPHY

The primary object of oil spill abatement and cleanup is to reduce the adverse effect of spilled oil on the environment. Physical removal and subsequent disposal or recycling/re-use is the preferred method. However, mechanical recover may be limited by equipment capability, weather and sea state, storage and disposal problems, and spill magnitude. Use of in-situ burning may be considered by the OSC when the preferred recovery techniques are inadequate and in-situ burning will lessen the environmental impacts of the spill. The FOSC must carefully weight the air quality concerns posed by an in-situ burn.

AUTHORITY

The National Contingency Plan, Section 300.910 authorizes the OSC, with the concurrence of the EPA representative to the RRT and, as appropriate, the concurrence of the State representative to the RRT with jurisdiction over navigable waters threatened by the release of discharge (of oil) and in consultation with the DOC and DOI natural resource trustees, when practicable, to authorize the use of in-situ burning on a case-by-case basis. The Commandant of the USCG has predesignated the USCG Captains of the Port under his jurisdiction of On-Scene Coordinators for oil spills, and has delegate authority and responsibility for compliance with Section 311 of the Federal Water Pollution Control Act to them. The USEPA has been delegated authority under Subpart J of the NCP to authorize use of in-situ burning for control of oil spills.

California Government Code Section 8670.7(f) delineates the Administrator of the Office of Spill Prevention and Response, Department of Fish and Game as having the State authority over the use of all response methods, including, but not limited to in-situ burning. The Governor of the State of California has delegated state representation on the RRT to the Administrator of the OSPR.

ANNUAL REVIEW

It will be the charge of the RRT ART Working Group to annually review the use of in-situ burning and report its findings to the RRT at a scheduled meeting. The group will be responsible for the administrative upkeep of the contact list as well as insuring that the plan is updated to reflect any changes in regional polices (including those of Region X, the state of Oregon and Mexico), and technological advances.

Guidelines Incident Specific RRT Approval:

Case-by-Case Process

If in-situ burning is to be successful it must typically be undertaken within a small window of opportunity following the release of oil, which often can be measured in hours. In order to accomplish such a task, the UC must have a mechanism at its disposal to expedite the in-situ burning use decision. An accelerated review process will be conducted by the Planning Section of the ICS and is designed to provide the UC with sufficient information to determine if an in-situ burning use request should be made and to provide members of the RRT with sufficient information to approve or disapprove within the first two hours of its receipt. The Administrator of the OSPR is committed to ensuring that stakeholders, including State and Federal trustee agencies as well as local air districts, have input into any recommendation made for the use of in-situ burning. As the review process will be conducted by the Planning Unit, it is within this structure that the stakeholders will fit into the ICS. There is also a need for the petroleum industry to commit and stock necessary resources to successfully implement a timely ISB response.

Air Quality Standards

Since burning will almost always provide for the greatest degree of environmental protection for on-water and nearshore resources (given the ability to remove on-water oil so quickly), a key issue is for the Unified Command to ensure that substances from an in-situ burn do not have a significant adverse impact to human health. The primary substance of concern is PM₁₀, the small particulate matter contained in the smoke plume. It is generally accepted that other substances dissipate, reaching background levels well before PM₁₀ does. An in-situ smoke plume usually stays well above ground level --- hundreds to thousands of feet --- but can reach the ground under certain atmospheric conditions. An action level for PM₁₀ has been established for these guidelines. It is recommended that in-situ burning should not be approved if there is significant risk that the standard would be exceeded where people could be exposed located. As a general guideline, a decision to burn should not be made where humans would be exposed to concentrations greater than 50 µg/m³ averaged over a 24-hour period. However, the UC must also consider the risk to humans from the volatiles that evaporate since in some circumstances, the adverse impact to humans may be greater from the volatiles than from the particulate matter generated from a burn.

Local Air Pollution Control Districts/Air Quality Management Districts

Within California, local air districts bear the primary responsibility for control of air pollution from all sources except motor vehicles, which remain the responsibility of the Air Resources Board (California Health and Safety Code 4000, et. seq.). Air districts are required to adopt and enforce rules and regulations and to prepare plans which make reasonable provisions to achieve and maintain State and Federal ambient air quality standards in all areas affected by emission sources under their jurisdiction, as well as enforcing all applicable provisions of State and Federal law. California has several different air basins within the State and each basin has an “attainment zone standard;” an air quality standard that is to be attained and maintained within the air basin. If attainment zone standards are exceeded, districts can impose several different regulatory mechanisms aimed at reducing air emissions and bringing the air basin back into compliance.

Under California law, the Administrator is responsible for the use of all ARTs in response to an oil spill in marine waters and he or she serves as the State representative on the RRT. During an oil spill, the Air Pollution Control Officer and/or staff members will be requested to take part in in-situ burn use decision through their participation in the ICS Planning Unit's ART section. The air districts can provide meteorological data, insight to air/flow dynamics and dispersion patterns that are necessary for the UC to make appropriate decision in a timely manner.

Violation of Containment Zone Standards

Local air districts were concerned that if they authorized an in-situ burn event which resulted in the accedence of an ambient air quality standards, it could jeopardize their attainment status. The USEPA issued a letter indicating that in-situ burning as an emergency response would be exempt from the general conformity requirements and may be considered as an exceptional event when considering the area's overall compliance status. A copy of this letter can be found in [APPENDIX--](#). This letter simply makes clear that there is a mechanism to exclude the in-situ burning air quality impacts from the data used to determine an area's ambient quality standard attainment status.

Trustee Agency Coordination

Marine Sanctuaries

Marine Sanctuaries comprise a significant portion of the coastal waters off California. The use of in-situ burning in the Sanctuaries will require coordination with the Sanctuary Managers and their staff. Though Sanctuaries are represented by the Department of Commerce delegate on the RRT, the Sanctuary Manager and/or staff members will be requested to take part in the In-situ Burning Decision-Making process through their participation in the ICS Planning Unit's Alternative Response Technology (ART) section. The Sanctuaries can provide resource data and insight necessary to make decisions that may otherwise not be available to the UC in a timely manner.

Observation and Monitoring

Air quality monitoring is not a requisite for the approval of an in-situ burn use. However, a case-by-case approval of in-situ burning should be done in a manner that fully considers any potential impact to public health and safety. Monitoring will be instituted as quickly as feasible after the approval to burn. Lack of a monitoring program will not delay a burn after the RRT gives approval.

Until recently, there has not been a standardized approach to monitoring alternative response technology use. A working group of federal scientist and oil spill responders has recently developed the Special Monitoring of Advanced Response Technologies (SMART) program to monitor the effectiveness of alternative response technologies including dispersants. The in-situ SMART program provides a process to rapidly gather information on the emissions from an in-situ burn and provide the information to the UC in a timely manner. Once this program is finalized, it will provide a practical and cost effective approach to monitoring and should be incorporated into the in-situ burn policy.

IN-SITU BURN DECISION GUIDELINES

Case-by-Case Zone

Case-by-case areas are defined as those areas not designated within the preapproval zones. This includes all marine waters within 35 miles off the California coast as well as areas of special jurisdiction as detailed in Appendix VI. Additionally, case-by-case also includes all inland waters. The FOSC will obtain approval from the EPA representative to the RRT and the California Department of Fish and Game (CDF&G) representing the State of California. Whenever fish or wildlife resources may be affected, the EPA and State representative to the RRT may consult with the DOI and DOC natural resource Trustees, including Sanctuary Managers as applicable.

Procedures for a Case-by-Case Request

- 1) The FOSC contacts the proper agency representatives on the RRT (Appendix X) and informs them that a request to utilize in-situ burning may be forthcoming. The FOSC will have the RRT remain on standby for the conference call in step 3.
- 2) ART Unit of Planning Section completes the In-Situ Burning Decision-Making Process submits summary of findings and information to UC on Case-by-Case Checklist Form and Supplemental Information Form.
- 3) If FOSC, based on information submitted by the ART Section, decides that a request for in-situ burning is appropriate, the FOSC schedules conference call with RRT representatives or alternates at first reasonable opportunity.

- 4) Conference call is conducted and Yes/No decision made based on information provided on FOSC Checklist, Supplemental Information Form or any other sources requested by the RRT, including information from the local air district.
- 5) The ART Unit of the Planning Section will commence with operations if a YES Decision is forthcoming.

Figure 1
Proposed In-Situ Burning Decision-Making Process
Decision Tree

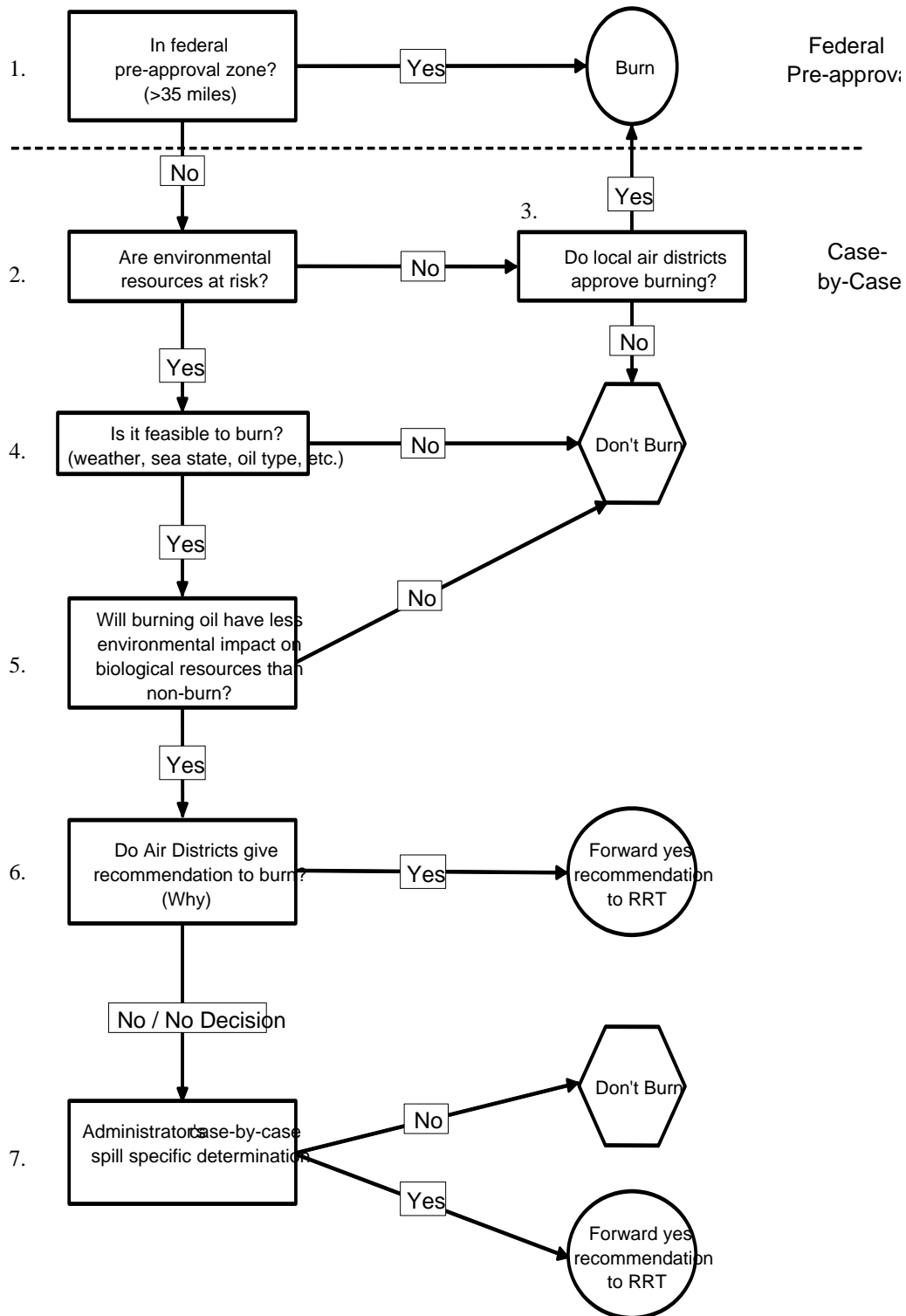


Figure 1 Decision-Making Points Explanations

The following discussion addresses the seven decision-making points that are a part of the approval process for the use of in-situ burning in marine waters. The discussion briefly identifies the nature of each point and also provides the rationale for each decision point. The number points correspond to the numbers in parentheses in the In-Situ Burning Decision Tree (found on the previous page).

1. If the proposed zone of in-situ burn is 35 miles off-shore and falls within the criteria of the Federal pre-approval zone, then an in-situ burn is Federally authorized by the RRT. State and local jurisdictions will be notified consistent with the provisions outlined in the LOA.
2. Most of the marine waters off California must be considered environmentally sensitive areas due primarily to the presence of foraging seabirds, migrating marine mammals, offshore islands with their marine mammal rookeries and haul outs, and the productive rocky intertidal and subtidal regions and associated kelp forests.
3. This specific path of the decision-making process would be very rare, indeed. There are not many situations (none foreseeable) under which an oil spill would not pose a threat to environmental resources. This decision point was included for purposes of completeness. If the unlikely situation occurred where environmental resources were not threatened, the UC would rely heavily on the recommendation of the local air districts for a burn/no burn decision.
4. Weather and sea state conditions can greatly affect the ability to burn oil on water. A minimum burn thickness is necessary to sustain combustion, so containment is always an issue. As this will mostly likely be accomplished by booming operations, those weather and sea state conditions that limit booming operations will operationally limit the ability to burn. As a general guideline, wave heights between 8-10 feet and wind speeds between 15-20 knots are generally the upper limits for boom operations.
5. The selection of in-situ burning as a cleanup/response tool is made using the hypothesis that spilled petroleum on the surface of the water (and eventually on the shoreline) or dispersal into the water column is more of a threat to natural resources than the combustion products are in the airstream. The hypothesis is tested using a data base that presents the resources at risk both on the surface of the water and within the surface microlayer and airstreams, by season, and how exposure to oil might affect the exposed species on a population basis. The risk analysis is based on the effects of petroleum on species populations at large and not individual animals, per se. All trustee agencies, local, state and federal, will work within the UC to determine if an in-situ burn will provide a net environmental benefit and better facilitate the protection of highly sensitive environmental resources.
6. Meteorological and other air dispersion characteristics will be an important component in the decision to recommend an in-situ burn by the local APCDs. Although vertical mixing is not usually a concern on the open water, plume dynamics can change if the wind direction changes and the plume comes into contact with land masses. For purposes of a case-by-case determination, the local air districts will provide their best professional judgement with respect to potential public health concerns and forward a recommendation to the UC.

7. There may be times when in-situ burning may be considered when local air districts are not in full support of the operation. Such circumstances would include the following:
- a) if onshore contact with human populations is expected to be small enough to limit the level of concern; or b) to take advantage of the rapid elimination of oil that in-situ burning affords before weather conditions change making cleanup almost impossible and causing extensive environmental damage. If the local air districts do not recommend the use of in-situ burning, the reasoning behind this must be detailed for review by the FOSC and possibly the RRT, should a recommendation for burning be forwarded. The information that should be detailed including any projected air mixing capability, any modeling and/or air quality exposure information and if concerns can be alleviated by means other than a non-burn decision (having people stay in houses for duration of burn), burning at night or non-peak hours. This information should be detailed on the supplemental case-by-case form.
8. Once the Checklist is completed and a decision for in-situ burning use is generated, the UC will forward their request, along with any requested data, to the RRT via a phone conference call. Based on the information provided, the RRT will provide an approval/disapproval decision for in-situ burning use.

CASE-BY-CASE CHECKLIST

The Case-by-Case Checklist is used by the Unified Command to determine whether a request should be forwarded to the Regional Response Team for In-Situ Burning Use. If the answer to any of the questions is no, further information must be gathered and summarized to support the position that an in-situ burn should be considered. This information, as well as all other information, should be forwarded to the RRT.

Checklist:

- | | | |
|-----|--|-----|
| 1. | Is the spilled petroleum burnable? | Y/N |
| 2. | Can the appropriate equipment be made available in a timely manner to effectively conduct an in-situ burn? | Y/N |
| 3. | Are weather and oceanographic conditions favorable for an in-situ burn? | Y/N |
| 4. | Does the in-situ burn pose less of an environmental risk than leaving the petroleum on the water surface? | Y/N |
| 5. | If required, have state and international boundary considerations been addressed? | Y/N |
| 6. | Has the local air district recommended the use of in-situ burning? | Y/N |
| 7.. | Has the ART Unit of the spill response team recommended the use of in-situ burning? | Y/N |

Basic information regarding the spill (weather, location of slick, type of oil, trajectory analysis, resources at risk, etc.) - see attached forms.

Phone Call List (refer to the contact list in [Appendix --](#))

<u>EPA</u>	Y/N
<u>USCG</u>	Y/N
<u>DOC</u>	Y/N
<u>DOI</u>	Y/N
<u>CALIFORNIA</u>	Y/N
<u>AIR DISTRICTS</u>	Y/

Support Information For Case-by-Case

1. Spill Information

A. Incident Information:

Cause of Spill _____

Date and Time of Spill

Location _____

Volume and Type of Release (Continuing vs Instantaneous) _____

Potential Volume to be Released _____

B. Characteristics of Spilled Oil:

Oil Type/Name _____

Specific/API Gravity _____ Flash Point _____

Pour Point _____ Viscosity _____

C. Weather and Water Conditions/Forecast:

Water Temp. _____ Air Temp. _____

Current Information _____

Wind Speed/Direction (present and 48hr projection) _____

Sea- State and 48Hr Projection _____

Tide Information and 48hr Projection _____

Comments _____

D. Oil Trajectory Information

Surface Area of Slick _____

24hr Slick Trajectory _____

48hr Slick Trajectory _____

Expected Land Fall (Location/Time) _____

Comments _____

2. Biological Resources at Risk
(Provided by OSPR in Consultation with Federal Trustee Agencies)

A. On-Water Resources _____

B. Shallow Subtidal Resources _____

C. Intertidal Resources _____

D. Anadromous Resources _____

E. Significant Surface Microlayer Resources _____

Supplemental Information

Below, please detail any reservations that may exist on the part of the local air district or any other technical specialists with respect to a proposed in-situ burn.

1. Nature of the Objections and Organization Raising the Objection:

Volume and Type of Release (Continuing vs Instantaneous) _____

Potential Volume to be Released _____

B. Characteristics of Spilled Oil:

Oil Type/Name _____

Specific/API Gravity _____ Flash Point _____

Pour Point _____ Viscosity _____

C. Weather and Water Conditions/Forecast

Water Temp. _____ Air Temp. _____

Current Information _____

Wind Speed/Direction (present and 48hr projection) _____

Sea- State and 48Hr Projection _____

Tide Information and 48hr Projection _____

Comments _____

E. Oil Trajectory Information

Surface Area of Slick _____

24hr Slick Trajectory _____

48hr Slick Trajectory _____

Expected Land Fall (Location/Time) _____

Comments _____

3. Biological Resources at Risk
(Provided by OSPR in Consultation with Federal Trustee Agencies)

A. On-Water Resources _____

B. Shallow Subtidal Resources _____

C. Intertidal Resources _____

D. Anadromous Resources _____

E. Significant Surface Microlayer Resources _____

[illegible][illegible]

1. On-Water Mechanical Cleanup Equipment Availability

<u>Equipment Type</u>	<u>Skimming Capacity</u>	<u>Estimated time of Arrival</u>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____

2. Spill Information

A. Incident Information:

Cause of Spill _____

Date and Time of Spill _____

Location _____

Volume and Type of Release (Continuing vs Instantaneous) _____

Potential Volume to be Released _____

B. Characteristics of Spilled Oil:

Oil Type/Name _____

Specific/API Gravity _____ Flash Point _____

Pour Point _____ Viscosity _____

C. Dispersant Information

Available Dispersants and Amounts _____

Laboratory Data on Dispersability of Oil _____

D. Weather and Water Conditions/Forecast

Water Temp. _____ Air Temp. _____

Current Information _____

Wind Speed/Direction (present and 48hr projection) _____

Salinity _____ Water Depth _____

Sea- State and 48Hr Projection _____

Tide Information and 48hr Projection _____

Comments _____

E. Oil Trajectory Information

Surface Area of Slick _____

24hr Slick Trajectory _____

48hr Slick Trajectory _____

Expected Land Fall (Location/Time) _____

Comments _____

3. Biological Resources at Risk
(Provided by OSPR)

A. On-Water Resources _____

B. Shallow Subtidal Resources _____

C. Intertidal Resources _____

D. Anadromous Resources _____

E. Significant Water Column Resources _____
